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grain ration, develop scurvy later, do not as a rule lose in weight, but on the contrary often gain in weight, live considerably longer and are in a much better physical condition, with the exception that scurvy usually develops, than those animals receiving 25 c.c. of milk from cows on a winter ration of ground oats, corn and barley, corn silage and alfalfa hay. We attribute this, tentatively, to the increased amount of fat soluble A in the "green grass" milk. We are now conducting experiments to ascertain the nature of this growth promoting substance.

In this preliminary paper we wish to state that our experimental work indicates, quite conclusively, that raw, lean beef does not possess antiscorbutic properties, so far as those properties can be tested by observations on guinea pigs. We have fed a cold water extract of meat representing 5, 10, 15 and 20 grams of meat, respectively, to guinea pigs receiving a basal diet of oats (ad libitum) and 25 c.c. of autoclaved milk. In all cases the guinea pigs developed scurvy just as soon as those animals which received nothing but oats and milk. When 5 c.c. of orange juice (daily) were added to the oats-milk diet and to the oats-milk-meat extract diet, all animals grew normally and no scurvy developed. We have not depended upon external symptoms and autopsies, solely, but have substantiated our findings by histological examination of the bones.

Owing to the fact that the guinea pig is a herbivorous animal, we have experienced some difficulty in being able to feed definite quantities of solid raw meat. By incorporating finely chopped meat into dry, rolled oats we have been able to show that scurvy will develop in practically the same time as when the meat extract was fed.

The experimental data will be published in the near future.

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AURORAL DISPLAYS

FOLLOWING a faint arch which was visible between 9 and 10 P.M. (75th mer. time), August 10, a crimson aurora extending over the northern sky and up to the magnetic zenith was observed here just before dawn, August 11, 1919. At 3:50 A.M. I noticed through the haze a curtain-like arch with a changing base which averaged about 15° above the horizon in the north, and with ends fading out in the east and west. At 4:00 A.M. a large portion of the western sky above 20° altitude became lighted with a vivid crimson glow. This coloring spread east above the whitish arch on the north until from 4:05 to 4:10 most of the northern sky from the zenith down to an altitude of about 25° was covered with it. The time of greatest brilliance was at 4:05 A.M., when whitish streamers were sharply defined in an arch which crossed the meridian between pole-star and zenith. These streamers converged at the magnetic zenith and formed a faint northern half of the auroral corona. After 4:15 the light of dawn augmenting that of the full moon dimmed the aurora till at 4:25 its last faint shafts of light were fading.

Whitish streamers were visible again at 8:35 P.M. about 50-60° up in the north, and for a little while there was a faint suggestion of an auroral arch: but the cirrus clouds, dense haze and full moon prevented further discernment of this display.

CHARLES F. BROOKS

CHEVY CHASE,
WASHINGTON, D. C.

AN unusual demonstration of the Aurora Borealis occurred at Ogunquit, Maine, on the night of August 11. The lights began at about 9:40 P.M. with the appearance of long, thin cloudlike masses extending horizontally a little west of north and about 25° above the horizon. This almost at once passed into curtain masses to the east, which remained less than ten minutes. The next (third) phase began by the sudden shooting up from the lower cloudlike masses of the long ribs of streak light which extended clear to the zenith.

These long vertical shoots of light presently extending around half the horizon, forming what was the most noted feature of the display for this locality; that is the continuity and great extent simultaneously over the heavens of masses of shafts of aurora half way about the horizon and up to the zenith where the light shafts met in a great cloud which momentarily shifted its form and extent.

Chromatic effects noted were pale rose pink and a delicate apple green. These were distributed apparently in local spots the green to east. A brilliant full moon added an unusual feature to the display. The lights faded suddenly about 10:15 P.M. and locally were not reported as of any moment later than that.

Aurora is not rare at this locality in August but this is the most extended demonstration seen by me here in some years.

FREDERICK EHRENFELD

OGUNQUIT, MAINE

I WAS very much interested in the descriptions of the auroral display of May 2, published in SCIENCE for May 23, and especially so in that of Mr. G. Irving Gavett, as it seems that I saw here in Washington, D. C., the same display that he saw in Washington state and at about the same time. I was observing with the photographic zenith tube of the U. S. Naval Observatory on that evening and entered a note, at about 12^h 0^m Washington sidereal time (14^h 27^m G. M. T.). The display at this time did not strike me as unusual except in the brightness of the illumination. There was the usual northern arch and streamers and at one time, of which I made no note, a patch of very deep red in the northwest.

At 13^h 43^m Washington sidereal time, I first saw what was to me a very peculiar display. A band of light as broad as the Milky Way, but much brighter, extended from a point on the western horizon about ten degrees south of Pollux, passed just north of the Sickle in Leo, over Alpha Canum Venaticorum and Corona Borealis and faded out on the eastern horizon about ten degrees south of Altair. It seemed nearly twice as broad at the meridian as at the

horizon. The lights of the city illuminate the southeastern horizon considerably and the intensity did not appear as great there as at the zenith, nor did it seem as bright at the zenith as in the west. I made the note "bright as an army searchlight at 13^h 43^m" for this part of it. It faded very rapidly until at 14^h 0^m Washington sidereal time it was "just discernible" in the west. But it brightened up again and at 14^h 15^m was as bright as the Milky Way in Cygnus on a very clear night and "traceable to the zenith." The band was broken into two parts between thirty and forty-five degrees from the horizon by a dark lane about one degree wide inclined at an angle of about fifteen degrees to the line of light and presented much the same appearance as the Milky Way in Cygnus in this respect also. The greatest intensity in this second maximum occurred at about 14^h 30^m. The light at this time seemed to pulsate slightly after the fashion of some streamers from the northern arch. This was not pronounced, however.

During the whole display the position of the band remained practically constant. A slight change in the position of the band with respect to the Sickle in Leo was noted but this was attributed to the motion of the stars themselves as they were setting, the shift of the band being southward. I do not recall the appearance of the northern sky at the time of this display. If there was aurora there it was not prominent.

In *Popular Astronomy* (Vol. XXVII., p. 405), Mr. William H. Wagner describes the same phenomenon as seen from West Reading, Pa. From his description and by the use of a celestial globe I estimated that its parallax as seen from the two places amounted to very nearly twenty degrees. West Reading, Pa., is roughly one degree five minutes east and one degree twenty-five minutes north of Washington, D. C. From a consideration of this data, which is inherently approximate, I deduce an altitude of 275 miles above the earth's surface for the beam of light. Its width from north to south then was about 60 miles, and if it was continuous between here and Seattle, Wash-

ington, where Mr. Gavett saw it, it must have been nearly 2,500 miles long.

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MONKEYS AS COCONUT PICKERS

E. W. GUDGER has recently called attention in SCIENCE to the use of monkeys as coconut pickers. The Malays and Bataks of Sumatra very commonly use monkeys in this way. The current English name there for the monkeys, *Macacus Nemestrinus*, is "coconut-monkey." The work of picking the nuts is performed in a way essentially the same as that described by Shelford and quoted by Gudger.

These monkeys not only work, but have a considerable commercial value as laborers. The price of a trained coconut monkey ranges from about \$8.00 to \$20.00; a price far above that put upon other common sorts of monkeys which are kept only as pets.

Coconut monkeys grow to a considerable size, and are very strong. They are also, usually savage, and will inflict a nasty bite whenever they have a chance.

CARL D. LA RUE
KISARAN, ASAHDAN, SUMATRA

SCIENTIFIC BOOKS

Vital Statistics: An Introduction to the Science of Demography. By GEORGE CHANDLER WHIPPLE. New York, John Wiley and Sons. 1919. Pp. 517. \$4.00 net.

Vital statistics have developed slowly in the United States. In spite of much progress in recent years, official records, including federal, state and municipal, still lack much in extent of the field covered and in detail of treatment. A nation-wide registration area for the recording and analysis of the elementary vital phenomena of birth and death is still unattained. A number of states and many of our cities of good size and of undoubtedly prosperity and economic development make no serious effort to collect the facts of their vital resources. It is no wonder then that we, in America, have lacked adequate text-books and competent teachers for the instruction of those interested in the science of

vital statistics. Physicians who would profit most from knowledge of the subject receive virtually no instruction in this science. Health officers, in like manner, have only, within the last few years, awakened to the value of vital statistics as a mechanism in their work and only a few are competent to use it effectively.

Professor Whipple's book will, therefore, help to fill a long felt want. It is, frankly, a book for health officers. It is not intended for advanced students as a contribution to the method of statistics. It is rather a guide to those who would be familiar with the simplest methods as applied to the public health field. Only Dr. Newsholme's volume on vital statistics (now out of print) has been available for English readers during the last three decades. The present book, perhaps altogether more attractive in its mode of approach, will now serve American students and will present recent, often current, data concerning their own country.

The book may be divided into two parts; the first covers the technique of practical statistics, the second discusses the phases of vital phenomena of populations. The appendices give a rather incomplete bibliography, the model law for reporting diseases, births and deaths and logarithms of numbers up to 10,000.

The first section, pages one to ninety-nine, is a useful first aid to the student of the methods of crude statistical description. The usual devices and methods are described clearly and even pleasingly. This is obviously Professor Whipple's *forte*. He, as a sanitary engineer, has given proper place in his own writings to the graphic methods and to other attractive means of clear presentation of statistical materials. The student will, however, unless he carries his studies much further than the text, find himself only at the threshold of statistical method after he has covered this first part. Perhaps this is all that is intended by the author, who assumes no special mathematical skill or equipment on the part of his students. This section would ordinarily have given the greatest